We claim:

1. A method for determining crystallization conditions for a material, the method comprising:

taking a plurality of different crystallization samples in an enclosed microvolume, the plurality of crystallization samples comprising a material to be crystallized and crystallization conditions which vary among the plurality of crystallization samples;

allowing crystals of the material to form in plurality of crystallization samples; and

identifying which of the plurality of crystallization samples form crystals.

2. The method according to claim 1 wherein the material to be crystallized is a macromolecule.

3. The method according to claim 1 wherein the material to be crystallized is a protein.

4. The method according to claim 1 wherein the material to be crystallized is a macromolecule with a molecular weight of at least 500 daltons.

5. A method according to claim 1 wherein the material to be crystallized is selected from the group consisting of viruses, proteins, peptides, nucleosides, nucleotides, ribonucleic acids, deoxyribonucleic acids.

6. A method according to claim 1 wherein the material to be crystallized is selected from the group consisting of viruses, proteins, peptides, nucleosides, nucleotides, ribonucleic acids, deoxyribonucleic acids.

7. A method according to claim 1 wherein the enclosed microvolume is a lumen.

1 8.   A method according to claim 1 wherein the enclosed microvolume is a
2 lumen with a cross sectional diameter of less than 2.5 mm.

1 9.   A method according to claim 1 wherein the enclosed microvolume is a
2 lumen with a cross sectional diameter of less than 1 mm.

1 10.   A method according to claim 1 wherein the enclosed microvolume is a
2 lumen with a cross sectional diameter of less than 500 microns.

1 11.   A method according to claim 1 wherein the enclosed microvolume is a
2 microchamber.

1 12.   A method according to claim 1 wherein the enclosed microvolume is at
2 least partially enclosed within a substrate which comprises other enclosed
3 microvolumes which also comprise crystallization samples.

1 13.   A method according to claim 1 wherein the enclosed microvolume is at
2 least partially enclosed within a card shaped substrate.

1 14.   A method according to claim 1, the method further comprising performing
2 a spectroscopic analysis on a crystal formed within a microvolume within the
3 microvolume.

1 15.   A method according to claim 14, wherein the spectroscopic analysis is
2 selected from the group consisting of Raman, UV/VIS, IR or x-ray spectroscopy.

1 16.   A method according to claim 14, wherein the spectroscopic analysis is x-
2 ray spectroscopy.

1 17.   A method according to claim 1, wherein the microvolume is enclosed
2 within a material defining the microvolume such that in a volume of the
3 microvolume and the material defining the microvolume that an x-ray beam used
4 for x-ray spectroscopy of a crystal will traverse in the process of performing x-ray
5 spectroscopy on a crystal within the microvolume, the volume of the microvolume

6 contains at least as many electrons as the sum of the electrons contained in the

7 volume of the material defining the microvolume that the x-ray beam will traverse.

1 18. A method according to claim 1, wherein the microvolume is enclosed

2 within a material defining the microvolume such that in a volume of the

3 microvolume and the material defining the microvolume that an x-ray beam used

4 for x-ray spectroscopy of a crystal will traverse in the process of performing x-ray

5 spectroscopy on a crystal within the microvolume, the volume of the microvolume

6 contains at least three times as many electrons as the sum of the electrons

7 contained in the volume of the material defining the microvolume that the x-ray

8 beam will traverse.

1 19. A method according to claim 1, wherein the microvolume is enclosed

2 within a material defining the microvolume such that in a volume of the

3 microvolume and the material defining the microvolume that an x-ray beam used

4 for x-ray spectroscopy of a crystal will traverse in the process of performing x-ray

5 spectroscopy on a crystal within the microvolume, the volume of the microvolume

6 contains at least five times as many electrons as the sum of the electrons contained

7 in the volume of the material defining the microvolume that the x-ray beam will

8 traverse.

1 20. A method according to claim 1, wherein the microvolume is enclosed

2 within a material defining the microvolume such that in a volume of the

3 microvolume and the material defining the microvolume that an x-ray beam used

4 for x-ray spectroscopy of a crystal will traverse in the process of performing x-ray

5 spectroscopy on a crystal within the microvolume, the volume of the microvolume

6 contains at least ten times as many electrons as the sum of the electrons contained

7 in the volume of the material defining the microvolume that the x-ray beam will

8 traverse.

1 21. A method according to claim 1, wherein material defining the microvolume

2 comprises a groove designed to reduce a number of electrons that an x-ray beam

3 used for x-ray spectroscopy of a crystal will traverse in the process of performing

4 x-ray spectroscopy on a crystal within the microvolume.

1   22.   A method according to claim 1, wherein the method further comprises

2   delivering the plurality of different crystallization samples to the enclosed

3   microvolume.

1   23.   A method according to claim 1, wherein the method further comprises

2   forming the plurality of different crystallization samples within the enclosed

3   microvolume.

1   24.   A method according to claim 1, wherein one or more dividers is positioned

2   between the crystallization samples to separate the crystallization samples within

3   the enclosed microvolume.

1   25.   A method according to claim 1, wherein the divider is formed of an

2   impermeable material.

1   26.   A method according to claim 25, wherein the impermeable material is an

2   impermeable liquid.

1   27.   A method according to claim 25, wherein the impermeable material is an

2   impermeable solid.

1   28.   A method according to claim 25, wherein the divider is formed of a

2   permeable material.

1   29.   A method according to claim 25, wherein the divider is formed of a

2   semipermeable material.

1   30.   A method according to claim 29, wherein the semipermeable material is a

2   gas.

1   31.   A method according to claim 29, wherein the semipermeable material is a

2   liquid.

1   32.   A method according to claim 29, wherein the semipermeable material is a

2   gel.

1   33.   A method according to claim 25, wherein the divider forms an interface

2   selected from the group consisting of liquid/liquid, liquid/ gas interface, liquid/

3   solid and liquid/ sol-gel interface.

1   34.   A method according to claim 25, wherein the divider is selected from the

2   group consisting of a membrane, gel, frit, and matrix

1   35.   A method according to claim 25, wherein the divider functions to modulate

2   diffusion characteristics between adjacent crystallization samples.

1   36.   A method according to claim 25, wherein the divider is formed of a

2   semipermeable material which allows diffusion between adjacent crystallization

3   samples.

1   37.   A method for determining crystallization conditions for a material, the

2   method comprising:

3   taking a plurality of different crystallization samples in a plurality of

4   enclosed microvolumes, each microvolume comprising one or more crystallization

5   samples, the crystallization samples comprising a material to be crystallized and

6   crystallization conditions which vary among the plurality of crystallization

7   samples;

8   allowing crystals of the material to form in plurality of crystallization

9   samples; and

10   identifying which of the plurality of crystallization samples form crystals.